SCHMIDT HAENSCH

Measurement of Polymer Films

Measuring the Optical Dispersion Behavior of Polymer Films

Challenge, Applications & Method

CHALLENGE

- **Variability in surface texture and flexibility of film materials**
- **Integration of optically active adhesive layers (e.g., PSA, OCA)**
- **Increasing demand for precision in optical lamination and adhesive bonding**

APPLICATIONS

- **Assessment of optical dispersion behavior for design**
- **Verification of optical uniformity in PVB, TCA, and OCA-based films**
- **Quality control in the production of optically bonded components**

METHOD

- **No sample preparation required**
- **Simultaneous acquisition of refractive indices at multiple wavelengths in a single measurement**
- **Supports a wide variety of film formats and flexural rigidity using modular sample holder**

Polymer films are thin, flexible materials made from synthetic polymers, offering versatile mechanical and optical properties. They can range from completely transparent to deep black, are often chemically stable, and can be tailored with specific adhesive characteristics, textures, and thicknesses. Common materials include polyethylene (PE), polypropylene (PP), polyethylene terephthalate (PET), polycarbonate (PC) and polymethyl methacrylate (PMMA), as well as more advanced polymers.

Their optical dispersion behavior, defined by refractive index across various wavelengths and temperatures, is key to predicting light interaction. Reliable optical data enables improved material selection, optimized product design, and consistent performance in complex optical assemblies.

POLYMER FILMS ARE USED IN:

- Optical laminates for displays and sensors
- Protective and bonding layers in automotive glazing and architectural glass
- Packaging films for food, pharmaceuticals, and consumer goods
- Adhesive films using PSA (pressure sensitive adhesives) or OCA (optically clear adhesives)
- Carrier layers for printed electronics
- Barrier films in medical and cleanroom settings

Application Note
Polymer Films

Solution From SCHMIDT + HAENSCH

Using the SCHMIDT + HAENSCH ATR L Multi-Wavelength Refractometer, optical properties of films are measured directly and efficiently. This method enables the accurate mapping of refractive indices across multiple wavelengths (365 - 960 nm), providing valuable insight into the material's dispersion characteristics. Whether for R&D or routine QC, the ATR L simplifies the complex task of analyzing adhesive layers, optical resins, or cured films like UV-cured acrylates, silicones, epoxies, or polyurethane adhesives. Beyond traditional quality control, evaluating dispersion curves allows for a deeper understanding of the material's function in optical systems, especially where light transmission, reflection, and adhesion are key factors.

ATR L
Refractometer

Product packages	Product	ID-N°	
Refractometer	**ATR L** Multi-Wavelength Refractometer	**03751**	
Sample Compartment Door	**REF 13** Sample Compartment Door for Solid Samples	**17290**	

ADVANTAGES

- Multi-wavelength refractive index measurement for detailed dispersion analysis
- Non-destructive method
- Suitable for soft films and hardened optical adhesives, including materials ranging from transparent to deep black
- Enhances material selection and performance prediction in optical systems
- Reduces cost and time associated with trial-and-error bonding tests

TYPICAL INDUSTRIES

- Optical component manufacturing
- Display and touchscreen production
- Automotive glazing and sensor integration
- Specialty film coating and adhesive formulation
- Research labs for advanced polymer materials

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